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Perception Of Green Spaces by the Populations in the City of Kinshasa, the Democratic Republic of Congo

[Perception des espaces verts par les populations de la ville de Kinshasa, en République Démocratique du Congo]

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Abstract

Urban green spaces contribute significantly to environmental quality and urban well-being, yet their sustainability also depends on how they are perceived and valued by urban populations. This study analyzes the perception of urban green spaces among residents of Kinshasa, Democratic Republic of the Congo, with a focus on the communes of Gombe, Kalamu, Matete, and N'Djili. A cross-sectional survey was conducted among 240 respondents using structured questionnaires. The analysis examined levels of awareness, knowledge of green space functions, and attitudes toward their use and potential conversion. The results indicate a high level of awareness: 90.4% of respondents reported knowledge of the existence of green spaces in their commune, and 85.8% were able to identify at least one such space. Ecological functions were recognized by 92.9% of respondents, social and recreational functions by 90.8%, and aesthetic functions by 83.8%. Attitudes toward conversion reveal strong opposition, as 88.3% of respondents disapproved of transforming green spaces into built-up areas. Among the minority supporting conversion (11.7%), housing needs (50.0%) and employment considerations (28.6%) were the main justifications. These findings indicate that urban green spaces are widely perceived as valuable and multifunctional urban assets. Integrating population perceptions into urban planning and governance strategies may enhance the effectiveness and social acceptance of policies aimed at ensuring the sustainable management of green spaces in rapidly growing African cities.

Keywords: Urban green spaces, population perception, environmental awareness urban planning, Kinshasa.

Résumé

Les espaces verts urbains contribuent de manière significative à la qualité de l'environnement et au bien-être en milieu urbain. Toutefois, leur durabilité dépend également de la manière dont ils sont perçus et valorisés par les populations. Cette étude analyse la perception des espaces verts urbains par les habitants de la ville de Kinshasa, en République Démocratique du Congo, en se concentrant sur les communes de Gombe, Kalamu, Matete et N'Djili. Une enquête transversale a été menée auprès de 240 répondants à l'aide de questionnaires structurés. L'analyse a porté sur le niveau de sensibilisation, la connaissance des fonctions des espaces verts et les attitudes vis-à-vis de leur utilisation et de leur éventuelle conversion. Les résultats montrent un niveau élevé de sensibilisation, avec 90,4% des répondants déclarant connaître l'existence d'espaces verts dans leur commune et 85,8% capables d'en identifier au moins un. Les fonctions écologiques sont reconnues par 92,9% des répondants, tandis que les fonctions sociales et récréatives le sont par 90,8%, et les fonctions esthétiques par 83,8%. Par ailleurs, 88,3% des répondants s'opposent à la conversion des espaces verts en zones bâties. La minorité favorable à cette conversion (11,7%) invoque principalement les besoins en logement (50,0%) et les considérations liées à l'emploi (28,6%). Ces résultats montrent que les espaces verts sont largement perçus comme des biens urbains multifonctionnels. L'intégration des perceptions des populations dans les politiques de planification et de gouvernance urbaine pourrait renforcer l'efficacité et l'acceptabilité sociale des stratégies de gestion durable des espaces verts dans les villes africaines en rapide expansion.

Mots-clés : Espaces verts urbains, perception des populations, sensibilisation environnementale, aménagement urbain, Kinshasa.

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1. Introduction

Urban green spaces are widely recognized as essential components of sustainable cities, providing ecological, social, and psychological benefits to urban populations (Jabbar et al., 2022). They contribute to thermal regulation, air purification, soil stabilization, and stormwater management, while also offering spaces for recreation, social interaction, and mental well-being (Grima et al., 2020; Remme et al., 2021). Beyond their biophysical functions, green spaces play a critical role in shaping urban quality of life and the relationship between city dwellers and their environment (Cameron et al., 2020; Berdejo-Espinola et al., 2021).

In rapidly urbanizing cities of the Global South, however, the presence and effective management of urban green spaces remain fragile. Population growth, spatial expansion, and competing land uses increasingly challenge their preservation (Wellmann et al., 2020; Li et al., 2022; Bille et al., 2023). While numerous studies have documented the physical decline or loss of green spaces in large African cities (Munyati & Drummond, 2020; Matsa et al., 2022; Appiah-Opoku et al., 2023) far fewer have examined how urban populations perceive, value, and socially interpret these spaces. Yet, public perception constitutes a key dimension of urban environmental governance, as it influences attitudes toward protection, misuse, neglect, or collective stewardship.

Perception determines how residents understand the role of green spaces, how they assess their importance in daily life, and how they position responsibility for their management between public authorities and citizens. When green spaces are perceived merely as vacant or underutilized land, they become socially vulnerable (Sharifi & Hosseingholizadeh, 2019; Siddique et al., 2022; Da Silva et al., 2023). Conversely, when they are recognized as valuable common goods, they are more likely to be defended, maintained, and integrated into urban planning processes. Understanding these social representations is therefore essential for designing effective policies and participatory strategies for urban environmental management.

In the city of Kinshasa, one of Africa's fastest-growing megacities, urban green spaces occupy a particularly sensitive position (Blanchard et al., 2024). The city's rapid demographic growth, combined with long-standing challenges in urban planning and service provision, has profoundly reshaped the urban landscape. In this context, residents' perceptions, awareness, and attitudes toward green spaces are likely to reflect both environmental concerns and everyday socio-economic realities. However, empirical data on how Kinshasa's populations perceive green spaces, their functions, and their governance remain limited.

The present study seeks to address this gap by examining the perception of urban green spaces by the populations of Kinshasa, with particular focus on the communes of Gombe, Kalamu, Matete, and N'Djili. Specifically, the study aims to: (i) assess residents' awareness and understanding of the functions of urban green spaces; (ii) analyze attitudes toward their use, protection, and potential conversion; and (iii) explore perceptions of responsibility and governance related to green space management.

By focusing on the social and perceptual dimensions of urban green spaces, this study contributes to a better understanding of how citizen awareness and attitudes can influence the future of green infrastructure in rapidly urbanizing African cities. The findings are intended to inform urban planners, policymakers, and local stakeholders on the importance of integrating population perceptions into strategies for sustainable urban development.

2. Material and Methods

2.1. Study area

The study was conducted in the city of Kinshasa, the capital of the Democratic Republic of the Congo. Kinshasa is one of the fastest-growing urban agglomerations in Africa and is characterized by rapid demographic growth, spatial expansion, and increasing pressure on urban land. The investigation focused on four communes-Gombe, Kalamu, Matete, and N'Djili-which were selected to reflect contrasting urban functions, socio-economic profiles, and patterns of land use. These communes include administrative, residential, and peri-urban contexts where urban green spaces are present and accessible to local populations.

2.2. Study design

A cross-sectional descriptive study was conducted to assess population perceptions of urban green spaces. The study adopted a perception-based approach, focusing on awareness, knowledge of green space functions, and attitudes toward their use and potential conversion. Data were collected at a single point in time in order to capture respondents' views under existing urban conditions.

2.3. Study population and sampling

The study population consisted of adult residents living in the selected communes of Kinshasa. A total of 240 respondents participated in the survey, with an equal number of participants (n = 60) selected from each commune to ensure balanced spatial representation. Respondents were selected using a quota sampling approach based on availability and willingness to participate, while ensuring diversity in age, gender, educational background, and socio-professional status. This approach was considered appropriate for capturing a broad range of perceptions related to urban green spaces.

2.4. Data collection tools and procedures

Data were collected using a structured questionnaire administered through face-to-face interviews. The questionnaire was designed to capture three main dimensions: (i) socio-demographic characteristics of respondents, (ii) awareness and knowledge of urban green spaces and their functions, and (iii) attitudes toward the use and conversion of green spaces. Most questions were closed-ended, allowing for quantitative analysis, while a limited number of questions addressed respondents' motivations and justifications.

Prior to the main survey, the questionnaire was pre-tested on a small group of respondents to ensure clarity, relevance, and consistency of the questions. Necessary adjustments were made based on feedback from the pre-test. Interviews were conducted in locations accessible to respondents, and explanations were provided when necessary to ensure accurate understanding of the questions.

2.5. Data analysis

Completed questionnaires were checked for completeness and consistency before data entry. Quantitative data were entered into Microsoft Excel and subsequently analyzed using SPSS version 21. Descriptive statistics, including frequencies and percentages, were used to summarize respondents' socio-demographic characteristics, levels of awareness, knowledge of green space functions, and attitudes toward green space use and conversion. Results are presented in the form of tables to facilitate interpretation and comparison.

2.6. Ethical considerations

Participation in the study was voluntary, and informed consent was obtained from all respondents prior to data collection. Respondents were informed about the purpose of the study and assured of the confidentiality and anonymity of their responses. The information collected was used exclusively for academic and scientific purposes.

3. Results

3.1. Socio-demographic characteristics of respondents

Table I. Socio-demographic characteristics of respondents (n = 240)

Variables	Categories	n	%
Sex	Male	193	80.4
	Female	47	19.6
Age group (years)	< 30	104	43.3
	≥ 30	136	56.7
Level of education	Primary school	28	11.7
	Secondary school	112	46.6
	Higher education	95	39.6
	No formal education	5	2.1
Socio-professional status	Civil servants / Public sector	115	47.9
	Private sector employees	56	23.3
	Informal sector	60	25.0
	Unemployed	9	3.8
Commune of residence	Gombe	60	25.0
	Kalamu	60	25.0
	Matete	60	25.0
	N'Djili	60	25.0
Total		**240**	**100**

Table I summarizes the socio-demographic characteristics of the 240 respondents surveyed across the four communes studied. The sample is predominantly male (80.4%), with more than half of respondents aged 30 years and above (56.7%), indicating that perceptions were largely captured from adults with sustained exposure to the urban environment. With regard to education, the majority of respondents had received formal schooling. Nearly half had completed secondary education (46.6%), while a substantial proportion had attained higher education (39.6%). Only a small fraction of respondents had primary education only (11.7%) or no formal education (2.1%). This educational profile suggests that respondents were generally capable of understanding and articulating perceptions related to urban green

spaces. The socio-professional distribution shows representation from the public sector, private sector, and informal activities, ensuring diversity of professional perspectives. Finally, the equal distribution of respondents across the four communes (25% each) provides balanced spatial coverage, supporting the reliability of subsequent analyses on population perceptions of urban green spaces.

3.2. Awareness and knowledge of urban green spaces

Table II. Awareness and knowledge of urban green spaces among respondents (n = 240)

Variables	Categories	n	%
Awareness of the existence of green spaces in the commune	Yes	217	90.4
	No	23	9.6
Ability to identify at least one green space	Yes	206	85.8
	No	34	14.2
Knowledge of ecological functions	Yes	223	92.9
	No	17	7.1
Knowledge of social and recreational functions	Yes	218	90.8
	No	22	9.2
Knowledge of aesthetic functions	Yes	201	83.8
	No	39	16.2

Table II presents respondents' levels of awareness and knowledge regarding urban green spaces. The results indicate a high level of awareness, with more than nine out of ten respondents (90.4%) reporting knowledge of the existence of green spaces within their commune. A similarly large proportion (85.8%) were able to identify at least one green space in their immediate environment, suggesting familiarity beyond simple awareness.

Knowledge of the functions of urban green spaces was also high. Ecological functions were the most widely recognized (92.9%), followed by social and recreational functions (90.8%). Aesthetic functions, although slightly less cited, were still acknowledged by a large majority of respondents (83.8%). Overall, these results show that urban green spaces are largely perceived as multifunctional elements of the urban environment rather than as vacant or unused land, reinforcing their perceived importance among the populations surveyed.

3.3. Attitudes toward the use and conversion of green spaces

Table III. Attitudes of respondents toward the use and conversion of urban green spaces (n = 240)

Variables	Categories	n	%
Opinion on the conversion of green spaces to built-up uses	Disapprove	212	88.3
	Approve	28	11.7
Reasons for approving conversion *(n = 28)*	Housing needs	14	50.0
	Employment opportunities	8	28.6
	Public infrastructure development	6	21.4
User status of green spaces	Regular or potential users	152	63.3
	Non-users	88	36.7

Table III summarizes respondents' attitudes toward the use and conversion of urban green spaces. The results indicate a strong opposition to the conversion of green spaces into built-up uses, with 88.3% of respondents expressing disapproval. This rejection reflects a predominant perception of green spaces as valuable urban assets that should be preserved rather than transformed. Among the minority of respondents who approved conversion (11.7%), housing needs emerged as the main justification (50.0%), followed by employment opportunities (28.6%) and the development of public infrastructure (21.4%). These responses illustrate the influence of socio-economic constraints on attitudes toward green space conversion. In addition, nearly two-thirds of respondents (63.3%) identified themselves as regular or potential users of green spaces, suggesting that direct or anticipated use may contribute to stronger opposition to their conversion.

4. Discussion

This study examined how residents of Kinshasa perceive urban green spaces, focusing on their level of awareness, their understanding of the functions of these spaces, and their attitudes toward their possible conversion into built-up areas. Overall, the results indicate a high level of awareness and a generally positive perception of green spaces across the four communes surveyed. Despite the rapid urban expansion experienced by Kinshasa, green spaces appear to remain visible and socially meaningful elements of the urban landscape.

The socio-demographic profile of the respondents provides useful context for understanding these perceptions. Most participants were adults aged 30 years and above, and a large majority had completed at least secondary education. This relatively high level of education may partly explain the level of environmental awareness observed in the study, since education is often associated with greater environmental knowledge and a stronger ability to articulate perceptions of urban environmental issues. At the same time, the respondents represented a variety of socio-professional categories, suggesting that awareness of green spaces is not limited to a particular social group but is instead shared across different segments of the urban population.

The findings reveal a particularly high level of awareness of urban green spaces. More than 90% of respondents reported knowing that green spaces exist in their commune, and a large majority were able to identify at least one such space in their immediate surroundings. These results indicate that green spaces are recognizable components of everyday urban life rather than marginal or overlooked areas of the city. Similar patterns have been reported in studies examining residents' perceptions of urban environments, which show that urban populations often demonstrate strong awareness of nearby green spaces even in densely populated contexts (Ugolini et al., 2022; Xu et al., 2024).

Beyond simple awareness, respondents also demonstrated a relatively clear understanding of the roles played by green spaces. Ecological functions were the most widely recognized, followed by social and recreational functions and, to a slightly lesser extent, aesthetic benefits. This distribution suggests that residents primarily associate green spaces with environmental benefits while also acknowledging their contribution to leisure, social interaction, and the visual quality of the urban environment. Such perceptions are consistent with recent research showing that urban residents often recognize the multiple ecosystem services provided by green spaces, including environmental regulation, recreational opportunities, and improvements in quality of life (Guo et al., 2024; Zhou & Tan, 2024).

These findings also align with earlier studies conducted in Kinshasa. Previous research has shown that residents are capable of identifying green elements within their neighborhoods and are aware of their gradual transformation under the pressures of urban expansion (Mvemba et al., 2021; Ngabinzeke et al., 2021). Taken together, these results suggest that the perception of green spaces is relatively well established among the urban population and that residents recognize their importance within the city's environmental and social landscape.

The results further show strong public support for the preservation of urban green spaces. A large majority of respondents expressed opposition to converting these spaces into built-up areas, indicating that they are widely perceived as collective assets that contribute to urban well-being and quality of life. The fact that more than 60% of respondents identified themselves as regular or potential users of green spaces reinforces this interpretation. Frequent or anticipated use of green environments often strengthens residents' attachment to them and increases support for their protection. Similar relationships between the use of green spaces and support for their conservation have been documented in previous studies (Nguyen et al., 2021).

At the same time, the presence of a minority of respondents supporting the conversion of green spaces highlights the socio-economic realities that shape urban land-use perceptions. Among those who favored conversion, housing needs, employment opportunities, and the development of public infrastructure were the main reasons cited. These responses illustrate the tension that can arise between environmental preferences and the immediate economic and social needs of urban populations. In rapidly expanding cities, where demographic growth intensifies demand for housing and employment, green spaces often compete with other land uses. Similar trade-offs between environmental protection and development pressures have been documented in studies examining urban land-use governance (Saha & Atiqul Haq, 2024).

Taken together, the findings reveal a clear contrast between strong public support for preserving green spaces and the socio-economic pressures that may lead some residents to accept their transformation. This contrast highlights the importance of taking population perceptions into account in urban planning processes. In cities experiencing rapid demographic growth, policies that balance environmental objectives with social and economic realities are more likely to gain public acceptance and contribute to the sustainable management of urban green spaces.

Some limitations should nevertheless be considered when interpreting these results. The study is based on self-reported perceptions collected through a questionnaire survey, which may be influenced by respondents' subjective interpretations or by response biases. In addition, although the survey covered four communes of Kinshasa, the findings may not fully represent perceptions across the entire metropolitan area. Future research could expand the geographic coverage of the study and apply multivariate analytical approaches in order to better understand the factors that shape perceptions of urban green spaces.

5. Conclusion

This study examined how urban populations in Kinshasa perceive and evaluate urban green spaces, using empirical data collected from 240 respondents across four communes. The findings show that awareness of urban green spaces is high, with more than 90% of respondents reporting knowledge of their existence and over 85% able to identify at least one green space in their surroundings. These results indicate that green spaces are clearly visible and recognizable elements of the urban environment.

Respondents also demonstrated a strong understanding of the functions of green spaces. Ecological roles were recognized by nearly all participants, while social, recreational, and aesthetic functions were also widely acknowledged. This confirms that green spaces are perceived as multifunctional urban assets that contribute to both environmental quality and everyday well-being.

Attitudes toward the conversion of green spaces further highlight their perceived value. A large majority of respondents (88.3%) opposed the transformation of green spaces into built-up areas, suggesting a strong attachment to their preservation. At the same time, the presence of a small group supporting conversion, mainly for housing and economic reasons, reflects the socio-economic pressures that shape urban perceptions and priorities.

Overall, the results indicate that population perception constitutes a significant social resource for the sustainable management of urban green spaces in Kinshasa. Integrating citizens' perceptions and expectations into urban planning and decision-making processes could strengthen public support for green space protection while helping to balance environmental objectives with social needs in a rapidly urbanizing context.

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Conflits of Interest

The authors declare no conflicts of interest regarding the publication of this article.

Ethical Considerations

ll experimental procedures performed in this study complied with applicable ethical standards. The sensory evaluation was conducted with the informed consent of volunteer participants.

Authors contributions

J-A.N.M.: Participated in the study and drafted the manuscript.

B.M.L.: Read and approved the final version of the manuscript.

C.S.M.: Collected the data and performed the statistical analyses.

A.O.N.: Contributed to the critical revision of the manuscript and to the interpretation of the results.

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